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SCIENCE AND TECHNOLOGY

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WEST EUROPE REPORT

SCIENCE AND TECHNOLOGY

CONTENTS

PECHINEY STRATEGY INCLUDES DEVELOPMENT OF NEW MATERIALS

Paris L'USINE NOUVELLE in French 19 Jan 84 p 35

[Article by Jean Roume]

[Text] Pechiney has taken control of the CTD [Desmarquest Technical Ceramics] Division of Lafarge Refractaires. Pechiney has decided not to start up the carbon-fibers plant the group has just built, together with Hercules, at Pont-de-Claix. It is studying the launching, in the near future, of an industrial prototype for the production of new Al-Li [aluminum-lithium] alloys...

Materials of the future are an integral component of the strategy of Georges Besse, president of the group, around whom the New Metals and Materials Division under Richard Armand occupies the same structural level within the group as do that of Aluminum under Georges-Ives Kervern and even that of Nuclear and Miscellaneous Industries under Gerard Munera.

Guidelines within the domain of materials of tomorrow are, by definition, more flexible and changeable than those of other sectors. They are based on reasoned assumptions and can be confirmed or nullified depending on technical performances obtained or outlooks for competitiveness more or less borne out. Thus, the suspension of work on the Pont-de-Claix plant (90 MF [million francs] invested and 60 jobs in the offing) was decided "because the two groups found that continuation of this project was not justified from an economic standpoint." This, according to sources within the group, will not preclude a decision to complete the plant, should the prospects for return on the capital invested in it take a turn again toward the positive.

On the other hand, the agreement that has just been negotiated with Lafarge Refractaires is aimed at achieving certain synergetic effects in the ultra leading-edge domain of technical-grade ceramics. CTD, one of the two highly specialized French firms in this sector--the other being Ceraver--has just developed, using pilot equipment installations, some new materials having exceptional thermo-mechanical properties. Its entry into the Pechiney group is going to enhance the development of these materials. They will extend the gamut of special ceramics now being manufactured by its subsidiary Howmet Turbine Components in the United States. The ultra-pure aluminum oxide,

zircon and silicon nitride powders--the raw materials of technical-grade ceramics--are produced by Pechiney's former subsidiary, Rubis Synthetiques des Alpes, which was retained at the time of the cession of PCUK [Pechiney-C [expansion unknown]-Ugine-Kuhlmann Company] and incorporated into Criceram. The entry of the group's New Metals and Materials Division into this sector is therefore one to be reckoned with.

This particular activity is far from being the Division's sole "iron in the fire. The group's research and development budget has just been increased by 25 percent, and over one-fourth of this augmentation is earmarked for the development of new metallurgies and techniques.

As was the case last year, a large part of it will go toward the development of at least three new families of aeronautical Al-Li alloys. "At Voreppe," explains Michel Erignoux, who is working on this project, "we have a test installation that furnishes us with ingots weighing several tens of kilos. A decision should be forthcoming soon on the construction of a prototype oven that will supply us with ingots weighing 1 ton." The addition of 1 percent of lithium reduces the density of the aluminum by 3 percent and its modulus of elasticity by 10 percent. By working with these two properties, the weight of a plane's airframe can be reduced by at least 15 percent. "The plane builders and the three worldwide specialists--one being ourselves--believe that Al-Li alloys will replace present aluminum alloys in the construction of planes by around 1988 to 1990."

Another major avenue of research that holds great promise is that of composite materials. Carbon fibers have been put to bed within the group, but very encouraging advances are being made "in the domain of composites comprised of fibers or aluminum-oxide and boron powders in association with aluminum--or Al-Li--matrices." Several processing methods are being explored and are yielding materials with structures, properties and performance characteristics that are extremely high or entirely new. It is now that the decisive choices are being made in regard to materials for the aerospace machines to come at the end of this decade.

9399
CSO: 3698/260

AEROSPACE

EUROPEAN VIEWS DIFFER ON SPACE STATION CONCEPT

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 11 Jan 84 p 25

[Article by Guenter Paul: "European Plans for Manned Space Travel"]

[Text] Super-rocket or space station? Differing interests in France and Germany.

The Spacelab mission with the German astronaut Ulf Merbold on board was--for ESA, the European Space Agency--a first step on the way to manned space travel. A German space lab mission (D-1) is planned for 1985. It seems certain even now that ESA does not want to let it go at that. This year, the member countries of ESA, which, starting this coming summer, will be directed by Professor Reimar Luest, from Garching, will decide how European space travel is to be developed in the long run.

Basically, two major projects are under discussion for the late 1980's and the 1990's. The French are in favor for the development of a rocket engine powered with liquid hydrogen and liquid oxygen which would have a thrust of about 100 tons. With this engine it would be possible to build rockets which, by the middle of the 1990's, could carry 15 tons of payload in a low earth orbit or 8 tons in a transition orbit for placement in a stationary earth orbit position. Ariane-1 can carry up to 4,850 kilograms into a low earth orbit and 1,750 kilograms into the transition orbit, while the figures for Ariane-4 in 1986 will be about 8,000, respectively, 4,200 kilograms.

The FRG on the other hand seems to prefer the construction of a European space station or the participation of the Europeans in an American space station. Together with Italy, Germany designed such a station by the name "Columbus"; it also uses the structural components of Spacelab, of "Spas" (Shuttle Pallet Satellite) which was placed in position last June by the Space Shuttle and which was then retrieved, as well as the experimental satellite "Eureca." Eureca is being built by MBB [Messerschmidt-Boelkow-Blohm] and, like Spas, is to be put into position by the Space Shuttle; it is to work on its own in space for 6 months. The first launch of Columbus would be possible in 1992, in other words, exactly 500 years after America's discovery by Christopher Columbus.

The Columbus space station could, during the 1990's, be stationed in space with a European rocket having more powerful thrust. A follow-on model for

Ariane-4 would in any case be so built that it would be suitable for manned space travel. Far more safety precautions are necessary for launches with astronauts on board than are being taken in the case of Ariane. This is being taken into account both in the French proposal, which is based on the development of a big rocket engine powered by cryogenic fuel, and in the other ESA rocket design for the 1990's.

If the Europeans were to decide to build their own space station, they would furthermore have to build a "space taxi" with which the astronauts could return to earth. Blueprints are also already in existence for this kind of vehicle which is called "Hermes." But it is more probable that ESA will try to participate in an American space station as is currently being pondered. Of course, President Reagan has not yet approved the construction of this station. His decision is a highly significant one already because many scientists doubt the usefulness of such a station, at least for this century. There is reluctance even in the Pentagon which, during the beginning of the 1960's, had urged the construction of MOL (Manned Orbiting Laboratory)--a project that was abandoned long ago.

According to NASA plans, a possible American space station is not a single, huge structure, but rather a system of interconnected, manned and unmanned platforms, laboratories, and satellites. The basic version for a crew of between six and eight men would be placed in an earth orbit around 1991 with an inclination of 28.5 degrees toward the Equator. This 120-cubic-meter base would already have two or three pressurized modules for individual research tasks. In addition, NASA wants an unmanned research platform in a polar orbit. At the end of the century, according to NASA plans--the actual station would be expanded for a crew of 12-18 men and the research platform, on a polar orbit, would be developed into a kind of factory.

The plans have deliberately not yet been worked out in very great detail. In this way, NASA is trying to tell possible partners--thinking above all of the Europeans--that they will have a certain right to have their say in the development phase. It is expected that Reagan will soon agree, especially since his opponent during the coming Presidential elections could be the Democratic Senator John Glenn, a former astronaut himself, who is in favor of building the station. The project's critics include Edwin Aldrin, likewise a former astronaut. Aldrin believes that the development of a big moon base is highly important for the future, among other things, because it would force the Americans to create a rational transportation system for space flights at higher altitudes. The Space Shuttle can be used only at low earth orbits.

The prerequisite for European participation in an American space station, in the opinion of leading experts, is that Europe must also be essentially involved in the construction of its nucleus and should not deliver just any old accessories which one could really do without. Besides, the Europeans should be guaranteed equal rights when it comes to access to the station. Europe would have to share in the benefit deriving from the station to the same extent to which it helps finance its construction--if it were to decide to participate in a project whose value is disputed even in the United States.

There must not be any more subsidiary activities, as in the case of Spacelab, which the Europeans built for almost DM2 billion but which they must rent from the Americans in each case, with the exception of the first flight which, moreover, was heavily reduced in terms of its scientific assignments.

At this time it looks as if the French would support the German-Italian plans for a European space station or for participation in an American space station if the FRG in turn were to agree to the execution of the French rocket plans. It would appear to be a matter of minor importance that ESA has its own designs for future rockets which, by the way, in contrast to the French rockets, would be partly reusable. European space travel obviously can no longer be visualized without this kind of mutual agreement method.

A similar agreement was the basis for the construction of Spacelab and Ariane. During the middle of the 1970's, the French were in favor of plans for a European space laboratory when it became clear that the Germans would in turn support the construction of Ariane. In 1981-1982, the decision was made in the same way to develop both Ariane-4 and the Eureca free-flying space platform. It seems to be generally known that there is strength in unity. The countries participating in ESA, of course, will have something to learn in this respect.

5058
CSO: 3698/258

MBB/ERNO'S VIEWS, FUTURE PLANS IN AEROSPACE ACTIVITIES

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 20 Jan 84 p 15

[Article by why: "Bremen space center ready for future tasks"]

[Text] Smooth cooperation with partners--Merbold visits MBB [Messerschmidt-Boelkow-Blohm]-Erno.

MBB/Erno Raumfahrttechnik GmbH, Bremen/Ottobrunn. Ulf Merbold, the first West German astronaut, this Friday, in Bremen, visited the facility where his space laboratory, called Spacelab, was designed and built. In Spacelab, he experimented for 10 days in November and December 1983 in outer space as so-called payload specialist. Merbold's visit, according to Hans Hoffmann, of the MBB/Erno business management, closes a circle after 10 years; that time span was needed to get from the moment at which the order was issued through ESA to the industrial consortium, which at that time was led by the then Erno Space Engineering, Inc., with partner companies from ten countries, all the way to Merbold's mission so as to make Spacelab ready to fly and to equip it with a payload.

Hoffmann is now convinced that the smooth cooperation of so many partners on an extremely complicated system persuaded the Americans that they have a full-fledged partner in the European space industry. The political stability, provided by the member countries, certainly also contributed to that; this political stability made it possible to complete the work to full satisfaction within an entire decade. This, according to Hoffmann, will certainly also be a basis for future cooperation between Europe and the United States in manned space travel.

After these spectacular successes, the Bremen Spacelab integration center expects that the North German space center has thus become adequately qualified for the follow-on tasks. Here it must be mentioned that the original Erno since 1981 has been a member of the biggest German space concern, that is, MBB; in this connection, the joint success of the year 1983, with the launching of the Exosat and ECS satellites, a double success of the Ariane booster rocket and the first free-flying, retrievable satellite called SPAS 01, brought the two locations of the concern (Bremen and Munich-Ottobrunn) closer together, so that the programs for the future can now be tackled together.

The second Spacelab is already being built in the workshops in Bremen; it was built for the Americans (with the contract being worth DM400 million). It is in the final integration stage and is to be shipped to the United States in May. In addition, the people in Bremen are currently also preparing the payload for installation in the system for the first German Spacelab mission which is scheduled for December 1985. The purpose of this mission again will be to work in a raw material laboratory to conduct material experiments and to engage in process engineering tasks, including, for example, experiments with so-called support-skin technology for tool-making and experiments with crystal growth in proteins.

The people in Bremen finally are full of anticipation as they ask the question as to whether the Western world will build a permanent space station. Scientists and engineers in Europe and the United States, as the people in Bremen heard, are now getting ready to go for it so that such a station will be available in space starting in 1992; a station of this kind could facilitate many manned and unmanned missions.

In the meantime, MBB/Erno again is building the first retrievable and free-flying experimental platform called "Eureca" (European Retrievable Carrier), together with European partners; it will be employed in 1987. The platform is to remain unmanned in an earth orbit for 6 months in order then again to be intercepted by the American Orbiter transport unit and to be returned to earth, in Bremen so that it may be converted for new tasks. Both of the space operations facilities in Bremen and Ottobrunn are currently working at full capacity with their 2,000 employees (half of whom are in Bremen).

On this occasion, MBB/Erno experts stressed something that was said 10 years ago during the Spacelab design phase: The goal of all efforts so far is to create the prerequisites for space travel for commercial use although, with a few exceptions, a certain degree of economic operation cannot be expected until the start of the next century. Areas of practical application for economically profitable space activities could, among other things, include energy engineering, environmental protection, medical technology, ocean technology, and raw material science.

5058
CSO: 3698/258

ITALIAN LASER RESEARCH APPLIED IN AUTOMOBILE FACTORIES

Milan MONDO ECONOMICO in Italian 26 Oct 83 pp 91, 92

[Article by Giuseppe Oddo: "Italy Underway"]

[Text] It is the first laser system with entirely Italian technology. Engineers of CISE, the Milan applied research center of the National Electric Power Agency (ENEL), where for 5 years they have been working on the final laser project of the National Research Council (CNR), expect to complete the project within a week. After that, the installation (which uses a carbon dioxide laser and 2.5 kilowatts of power), will be turned over to a manufacturing industry in Lombardia. The cost of the system after it goes into industrial production will be around 400 million liras. However, this is only one of the developments in the laser sector in Italy. Their potential is in fact arousing considerable interest among entrepreneurs. In Milan, for example, a number of small and medium-size factories for laser production are being established. Other companies among those already active in the sector (LISS, Multilaser and Valfrive in Firenze, SPEIS in Modena, and GSG in Torino) are experimenting with the technology developed in the final project.

The importance of the stakes are shown by the recent market indicators. According to the most plausible estimates, the Italian market for lasers applied to mechanical processes (thus excluding biomedical) is today estimated at about 4.9 billion liras, and by the end of the current decade should be about 35.5 billion liras. This is without taking into consideration that such an increase in the domestic market would predictably be accompanied by an increase in exports to the FRG, France, and the United Kingdom, the most advanced European countries in this field.

Also, among the various applications it is in operations of cutting materials that lasers will be most widely used. Laser cutting, in the case of metal materials of a maximum thickness of 4 millimeters, is far more competitive than conventional techniques in that it enables a high degree of automation and resulting saving in time and personnel. At Fiat Cavis in Alessandria, for example, where a system has been installed for some time, a 50-percent increase in productivity has been achieved for an investment of 800 million liras. However, until now systems of this type produced in Italy have incorporated imported technology. For example, lasers in the Soitaab system in Monza and the Parimor system in Bologna were purchased abroad. Albert Sona, director of the final laser project and member of the CISE research

management staff, commented: "There could be a change of direction in a not distant future once the technology of powerful laser sources becomes the object of new industrial initiatives." CISE is itself taking a step in this direction by developing in its laboratories a cutting system, commissioned by Alfa Romeo, that will join the one the Milan auto industry recently purchased from the German company Messer Griesheim.

The other major field of laser application is drilling and welding operations. The major beneficiary of these systems, particularly for welding, will be the automobile industry. This is the case for General Motors and Fiat. The Turin establishment has installed at Mirafiori several lasers that make it possible to perform 3,000 welds per day on engine gears for the Ritmo and the Uno. The savings by this operation compared to conventional techniques previously used has been estimated at about 300 liras per part produced. The experts say that in the course of 2 years these cost reductions could equal or even exceed the cost of the installation.

However, all these applications, which fall in the category of so-called civilian uses, represent only the smaller share of the laser systems market. In fact, the military applications account for 53 percent of the overall market, worth about 1.4 trillion liras, while civilian applications amount to 34 percent of the market, or about 800 billion liras. For this reason, in Italy companies such as Selenia, Galileo and Fiar, producers of solid state lasers of the neodymium type, still prefer to operate in the more lucrative military market. In contrast, the United States exploits its advantage in the military field to transfer some laser technologies to the civilian sector.

The existence of both civilian and military markets for laser systems and the diversity of the applications thus justify the industrial interest, which has developed worldwide in regard to these technologies. However, there are a number of factors that currently limit laser development, not only in Italy but also in Europe. The experts maintain, in this connection, that the number of system producers, despite increases from year to year, is still too small in relation to potential demand. On the other hand, the high cost of production of laser sources, for which significant research and development investment is required, makes the task of the small and medium-size companies increasingly difficult. In effect, these are two contradictory factors that, in combination with the almost total lack of support and maintenance facilities for the systems, will continue to affect the development of this sector for several years, particularly in Italy.

9920
CSO: 3698/262

PASSENGER CAR SALES AID GROWTH OF DAIMLER BENZ IN FRG

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 16 Dec 83 p 15

/Article: "Daimler Benz: Automobiles Bring Growth"/

/Text/ In the fiscal year currently ending the company's growth is clearly due to the automobile business. Professor Werner Breitschwerdt, the new chairman of the board, explained in a first summary that the growth rate in this sector amounted to approximately 13 percent. According to these figures the corporation's sales will increase by DM0.7 billion to DM31.8 billion, in contrast to which the conglomerate will show growth of DM0.4 billion to DM39.3 billion. In the year under review Daimler Benz will manufacture a total of 475,000 automobiles, 3.6 percent more than the previous year.

The largest part of the growth is in the S Class where with a total of 114,000 units approximately 10,000 more came off the assembly line than in the previous year. Of the more than 109,000 units in the new Series 190 a large part was at the expense of Series 123 (200 to 280 E) since for reasons of capacity full production was possible only in Sindelfingen. According to Breitschwerdt's figures the level of orders for Series 123 would have permitted substantially greater production. It is, therefore, probably not wrong to assume that Daimler Benz could have sold more than ½ million automobiles in 1983 if the factory in Bremen had been fully available as planned. Production there had been delayed by about 2 years because of objections.

The 190 model has attracted new customers for the company. Roughly half the domestic buyers came from other makes, this share was even higher in many foreign markets. The company is hoping for further stimulation of business with this series with the introduction of the diesel model which is just starting.

With commercial vehicles the picture is uneven, but overall comparatively gloomy. Domestically there was in fact increase demand, but that is offset by a drastic worsening in many foreign markets, primarily in the petroleum countries. Thus, the corporation's production this year will decline by about 7 percent to 173,000 commercial vehicles; production in factories abroad will decline even more, specifically by 15 percent to 48,000 trucks and buses; the decline is almost totally in the Brazilian market. In the United States the Freightliner subsidiary substantially increased production and market share.

The corporation's work force has remained basically unchanged at about 150,000 employees. As was previously the case in the company, there was no short-time work nor firings. Employment difficulties in the commercial vehicle factories were balanced out by assignments to the automobile factories. Approximately 2,800 apprentices were employed by Daimler Benz this year, the highest number ever. Thus, at present, 8,300 young employees are receiving training. The rate as compared to total personnel is roughly twice that of an important north German automobile company with strong influence of the state.

Naturally Breitschwerdt did not yet make a definitive statement about the result. The good utilization of the automobile capacities and the continuing strength of the dollar had a positive effect. The strong competitive pressure in commercial vehicles and the more unfavorable utilization in this are on the other hand had an impact on the result. Overall, however, a "satisfactory result" is anticipated. Thus, the company's basic principle of continuity and stability can consequently also apply to the expectations of the stockholders.

12124
CSO: 3698/228

BRIEFS

INTERFACE SOFTWARE FOR AIRBUS INDUSTRIE--To solve communication problems between graphic data bases belonging to different computer-aided design systems, Airbus Industries has asked Aerospatiale to develop a series of interface software. This software series, called SET [expansion unknown] will become available by mid-1984. SET is said to perform approximately 5 times better than the U.S. IGES [expansion unknown] system. It will also have the advantage of becoming available soon and of taking into account the users' actual needs. Aerospatiale is contemplating marketing SET in Europe so as to create a group of users that might influence IGES designers. [Text] [Paris BUREAUX D'ETUDES in French Dec 83 p 6] 9294

CSO: 3698/264

SWEDEN DEVELOPS NEW RAPID SOLIDIFICATION PROCESS

Stockholm TEKNIK I TIDEN in Swedish Autumn 1983 pp 12-13

> [Text] Rapid solidification process produces new materials possessing new properties. STU [National Board for Technical Development] is launching a 5-year program giving Sweden an opportunity to spearhead research.

A process for extremely rapid cooling and solidification of metal smelts could create new materials having new properties.

For example, the new process can be used for new aluminum and copper alloys with better mechanical properties at high temperatures. Using the rapid solidification process, superalloys with nickel and cobalt can be made more malleable--a quality usually lacking in some of them.

Research in this area is quite new. The United States and Japan have made the greatest progress, but several other countries are also working with rapid solidification and new microcrystalline alloys.

With the 1984/85 budget year, STU is initiating a 5-year basic program for research in the field of rapid solidification at a total cost of about 14 million kronor.

Research in this field is underway in Sweden at the Institute of Metals Research under the direction of Lars Arnberg. The project is being supported jointly by STU and nine Swedish businesses: Sandvik Steel, Sandvik Hard Materials, Uddeholm, Fagersta, ASEA, Hoganas Inc, Granges Aluminum, Jernkontor's Division of Nonferrous Alloys and FFV [Swedish National Defense Manufacturer] Maintenance.

Arnberg worked as a visiting researcher at MIT of Boston in the United States, where there is great interest in the field of rapid solidification. He is now directing a pilot project in the field in Sweden.

At the Institute for Metals Research in Stockholm there is a laboratory equipped for rapid solidification experiments. It is here that a series of experiments will be conducted during the next several years.

Ordered Structure

Rapid solidification alloys are being studied at KTU [Royal Technical University], the University of Stockholm and Chalmers. The major interest has been devoted to amorphous alloys, those alloys whose atoms do not form crystals during solidification.

"We, on the other hand, want to concentrate on microcrystalline alloys, that is, on alloys with an ordered structure with very small crystal grains. These probably have a significantly greater development potential for Swedish industry," says Arnberg.

"The crystalline materials can be produced in powder form and then compressed into bulk products for various uses. Sweden is among the world's leading nations in powder metallurgy," says Arnberg.

"Pressure and heat are applied as a material consolidates, and the changes that occur in the material can be controlled rather easily. It is considerably more difficult to consolidate amorphous states with retained properties," he adds.

Rapid solidification in such a context as this requires cooling rates of at least 100,000 degrees per second. These are the cooling rates used at the Institute for Metals Research. The concept of rapid solidification uses other cooling-rate values as well: some applications require a rate of 1,000 degrees per second.

Particles

When using an extremely rapid cooling rate, it is not advisable of course to work with large batches. Here, the cooling rate is limited by the capacity of the material to conduct heat.

Particles with cooling rates of 100,000 degrees per second are no larger than one-tenth of a millimeter.

Japan and the United States are so far ahead in research on amorphous alloys that Sweden could hardly compete without investing very large sums. However, a few original ideas might be worth developing along the lines of efforts now getting underway.

The Research Front

The situation is somewhat different in the case of crystalline alloys. The research field is newer, and Sweden has an opportunity here to be among those spearheading research. This is at least the intent of the 5-year program.

"Let us say that after this 5-year program we have built up a competence in the field, and that both the Institute for Metals Research and businesses have the equipment. Maybe by then we will have come up with new materials with unique properties," says Arnberg.

New Materials

"After another 5 years, some commercial products could be on the market. One might also suppose that Swedish companies would be interested then in buying rapid solidified materials for production here at home," says Arnberg.

The methods applied in the production of rapid solidified material from smelts are chiefly the following:

There is first the process of splat cooling. The technique has been developed over the past few years for continuous casting of rapid-cooled fibers or strips. The metal smelt is ejected under pressure onto a rotating substratum, typically a copper cylinder that can be cooled for the production of larger quantities of material. The cylinder has a diameter of several decimeters and rotates at a speed of up to 5,000 revolutions per minute. It produces 10 to 50 meters of strip per second.

The cooling rate depends on the thickness of the strip and usually ranges between 10,000 and 1,000,000 K/sec for strip thicknesses of 20 to 200 micrometers.

The technique is called melt spinning and is the one most used today to produce amorphous alloys. There are installations in operation that are producing ten kilograms of material per batch.

Sheets

In roller quenching, the metal smelt is allowed to trickle or drip down into a narrow chink between two rotating cylinders. In this case, the cooling rate is not quite so high because the smelt remains in contact with the substratum for a shorter time. However, somewhat thicker sheets can be produced.

The method has been used successfully in producing microcrystalline materials in 10-kilogram batches. But the cylinders must maintain extremely exacting tolerances and are subject to rapid wear, which could be a problem in large-scale production.

The melt extrusion method differs from those mentioned above. Here, the smelt is stationery and in contact with a rapidly rotating wheel which draws the smelt and produces fibers.

This method has been used for several years in the commercial production of fiber and several alloys. In commercial installations, the cooling rate is around 1,000 C/sec.

Atomization

Yet another technique, called atomization, is found in several applications, for example, where a high solidification rate in powder is desired. Here, a gas or liquid is sprayed on the material, which decomposes and yields a metallic powder. Higher pressure results in more rapid cooling.

This is the technique that will now be applied in Sweden. The Institute for Metals Research has procured the know-how and equipment from MIT in Boston.

Separation

If a gas jet is allowed to pulsate in the ultrasonic range, gas velocities are produced that are double the speed of sound and the smelt is decomposed into small powder particles at a cooling rate of around 100,000 K/sec.

Arnberg explains: "The smelting of an alloy is a process of decomposition. There are few basic elements that cannot be dissolved in considerable amounts in a steel smelt, for example.

"Solidification, on the other hand, is a process of separation. Normally, the alloy additives will concentrate in the last portion to solidify during casting. Thus, the various parts of the ingot acquire different properties. This once limited the choice of alloys.

"Using the rapid solidification process, almost any combination of alloy additives can be employed and produce homogeneous materials. This creates totally new possibilities."

Homogeneous Materials

Some of these possibilities have already been mentioned. But there is not yet so much known about its meaning for steel production. Researchers around the globe are working on the problem, and in some cases steel has been produced with improved mechanical qualities, including better tensile strength and durability. Resistance to corrosion can perhaps be improved as well.

The rapid solidification process might also be applied to simplify the recycling of scrap aluminum.

Says Arnberg: "Using the new technique will probably be quite expensive at first. It will be used initially in more limited contexts, such as aircraft engines, etc. But in the long run, the technique will become less expensive and therefore more widespread."

9992
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FRANCE DEVELOPS NEW CONTINUOUS VACUUM TREATMENT METHOD

Paris L'USINE NOUVELLE in French 26 Jan 84 pp 72-73

[Article by Jean Nenin: "Heat Treatment: A Continuous Vacuum Furnace"]

[Text] Capable of heat treating 250 kg of parts per hour, the furnace now used by Thierry Dimier in Chassieu is the first of its kind in France and probably worldwide.

To offer the advantages of vacuum processing to mass produced parts for less than it would cost in a batch furnace, such was the objective of Thierry Dimier, a heat-processing firm in the Lyons area. For the various treatments used (induction hardening, case hardening, etc.) productivity had to be improved without compromising quality. It soon became obvious that the solution was a continuous furnace. As Gerard Protat, general manager, explained it: "We then contacted vacuum furnace manufacturers, but we soon came across a snag." They did find a continuous vacuum furnace manufacturer in the United States, the Hayes Company, but until now hardening was achieved by immersion in an oil bath. However, Gerard Protat went on, "what we wanted was hardening in a controlled atmosphere under an adjustable pressure of up to 4 bars."

Fortunately, through its British licensee, the Wellman Company, the manufacturer agreed to consider and implement this major change as well as a few other changes resulting in greater furnace automation. The total cost rose to 3.2 million francs, compared with an initial price of 2.5 million for the furnace alone.

The processing assembly includes the furnace proper plus, upstream from the furnace, an ultrasonic cleaning facility and the charging lock-chamber and, downstream, the hardening lock-chamber with its controlled atmosphere, which also acts as an unloading chamber. The components are connected to one another, and the lock-chambers to the outside through tight doors.

The facility layout was completed late in the summer of 1983 and industrial-scale testing began on unit and mass-produced parts. The parts treated included quick fittings made of Z-30-C-13 stainless steel and computer disk blanks made of Z-100-CD-17 steel (the latter at the rate of 5,000 per week).

The parts are arranged on trays whose useful dimensions are 610 x 460 x 250 mm (depending on their shapes, the parts are placed on racks or in baskets).

The trays (three for the furnace and one for each lock-chamber) are moved along a roller conveyor by manipulators which can extract or push them, as they are provided with retractable "fingers" that fit into tray openings. Between the conveyor and the charging lock-chamber (or the hardening and unloading lock-chamber), the manipulators work in the open but those located between the lock-chambers and the furnace are specially designed to work under vacuum. According to Gerard Protat, "this sequential operation may or may not be considered as continuous, but the result is a high productivity, of the order of 250 kg/h (including the racks or baskets). During tests on bolts and nuts, a rate of 185 kg of parts per hour was achieved for 24 hours in a row. Operating in three 8-hour shifts, monthly production could reach 50-60 tons."

The energy consumption is 0.46 kWh (compared with 1 kWh for a batch furnace). This is achieved through a careful thermal design of the furnace and its accessories.

Vacuum Provided by Mere Pumps

The furnace includes a heating chamber with a double lining: 25 mm of ceramic fibers and 25 mm of graphite fibers, in which are embedded the 14 heating elements representing a power of 142 kW, which make it possible to reach temperature of 1,315°C. The chamber is provided with two isolating doors, and each tray fits into a heating zone whose temperature can be individually adjusted. The outer wall of the furnace is cooled by water circulation. Gerard Protat went on: "We chose a vacuum of 10^{-2} torr, i.e. less than in batch furnaces; in the case of the latter, opening the doors places the inside in direct contact with the outside atmosphere. The vacuum is provided by mere primary vane pumps."

Testing on Small-Diameter Drill Blanks

During hardening, the lock-chamber is placed under vacuum and a tray is extracted from the furnace. The tight door is then closed and a mixture of nitrogen and 5-10 percent of hydrogen is injected. This cools the parts, but the mixture is simultaneously strongly agitated by a turbine. Around the hardening unit, a tubular exchanger provided with fins and deflectors ensures uniform cooling throughout the part. It uses water circulation under pressure. "We have also provided for hardening under an argon atmosphere," Gerard Protat went on, "for parts that must not come into contact with hydrogen at this stage of their treatment. The facility is completed by two tempering furnaces (one at 200°C and the other at 700°C) which can be used for additional treatments. They can also operate under vacuum and the nitrogen-hydrogen mixture can be injected into them."

"We are still carrying out tests," Gerard Protat pointed out, "to determine the cycles, the temperatures to be used with certain grades of steel, depending on the shape of the parts. For instance, with bearing races (about 10 x 8 mm) made of 100-C-6 steel, we have a microstructure problem, as we do with 35-CD-4 steel parts. On the other hand, everything went well with self-hardening steels like the 35-NCD-16 and 40-NC-15 grades. We have also successfully completed the hyper-hardening of the stainless steel used for compressed-gas accumulator bodies and the hardening of case-hardened layers. The latter, in a salt bath after successive machining operations, was a tough problem, as the carbon content varied from 0.4

percent for the case-hardened part to 0.1 percent for the part itself." Another future prospect: high-speed steels like the 6-6-2 grade. "We are now making tests on small-diameter drill blanks; they, too, can be treated economically only in a salt bath."

Microprocessors will also be used in this new facility. "We made it a point to design our equipment starting with the regulation cabinet but, as we progress with our development, we are considering using cards to control repetitive cycles."

9294
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STC MODERNIZES FOOTSCRAY PLANT FOR 1.5 MICRON TECHNOLOGY

Paris ELECTRONIQUE ACTUALITES in French 13 Jan 84 p 15

[Article by FG]

[Text] The English company STC Components (subsidiary of the STC group) has decided to invest about 730 million francs (60 million pounds) in its Footscray (Great Britain) semiconductor plant, in order to install a 1.5 micron technology for standard memories.

We might recall that STC separated from ITT more than a year ago, when the American group placed on the stock market 70 percent of its shares in the former company (it is keeping 30 percent); STC bought the ITT Semiconductors Footscray plant last March.

The semiconductors division of STC Components (STC Semiconductors) intends to build at Footscray a new installation incorporating the most modern fabricating techniques (ion implantation, plasma etching, direct step-and-repeat on wafers of at least 5 inches). Its objective is to have, by the end of 1986-beginning of 1987, a 1.5 micron production technology (for 256K DRAM, 64K and larger CMOS SRAM, and for EEPROM), and to multiply the company's semiconductor sales by a factor of five by 1990. For CMOS SRAM, STC intends to develop its own circuits but could buy the technology (CMOS with two levels of polycrystal silicon) outside the group.

As part of the same investment plan and in addition to the new plant, STC will install at Footscray fully automated assembly lines as well as a design center, and will invest much more in research and development.

During the first phase of the project, it also expects to significantly increase its CAD (computer-aided design) facilities, both for redesigning existing RAM (in order to reduce chip size) and for designing future 64K and larger CMOS SRAM. It also intends to develop a CAD system in conjunction with Standard Telecommunications Laboratories and other research laboratories.

CMOS Gate Arrays Design

When it was directed by ITT semiconductors, the Footscray plant had become the group's worldwide center for the design and production of logic circuits and memories. Under STC, which intends to remain one of the leading European memory manufacturers while diversifying, it will continue to produce primarily memories, but will expand its range of products to include standard components for telecommunications, the military, and computer peripherals, as well as a family of CMOS gate arrays.

The English company did not indicate which portion of the investment will be devoted to memories, nor the percentage of the telecom circuit production which will be consumed within the group. But the 64K DRAM production, which is currently 50,000 units per quarter, will certainly be increased. We should point out that until the end of this year, STC is represented in France by ITT Composants.

At the same time, DIM Inter has signed a two-year franchise agreement with STC.

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CSO: 3698/259

BRIEFS

FRENCH ONE-MICRON C-MOS--LETI's (Electronics and Data Procesing Laboratory) 1 micron/1.4 micron channel length C-MOS technology should be transferrable to industry within one year. But future generations are already being studied: using direct on-wafer electron-beam lithography, LETI has already fabricated devices with 0.3 micron grids and 0.15 micron channels, operating at 3 V max (beyond which lifetime decreases). Their speed has not yet been measured for lack of suitable equipment. [Text] [Paris ELECTRONIQUE ACTUALITES in French 13 Jan 84 p 16] 11,023

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SCIENTIFIC & INDUSTRIAL POLICY

PHILIPS' EXECUTIVE SAYS PRODUCTION COSTS CAUSE LOSSES

Rotterdam NRC HANDELSBLAD in Dutch 15 Dec 83 p 15

[Interview with LL.M. F.F. Otten, member of the board of Directors and chairman of the general management of Dutch Philips, and with LL.M. R.J. A. de Lange, assistant social affairs director of Dutch Philips, apparently in Dec 1983 in Eindhoven by editor Kees Calje: "Top Executive LL.M. F.F. Otten of Dutch Philips Industries: 'Better Climate Doesn't Lead Directly To Upturn'"]

[Text] Eindhoven, December--If enterprise again becomes attractive in the Netherlands, what will Philips do? Philips is of old the largest private employer in this country, even though the number of Dutch employees is still continually dropping. Between September 1982 and September 1983 by 2,700 to the still respectable number of 71,600. "But the decline is running its course less quickly than we at first expected," says Master of Laws F.F. Otten, member of the board of directors and, until 1 January, chairman of the general management of Dutch Philips Industries, B.V. [closed corporation].

Otten headed Dutch Philips Industries for two years, after the B.V. under discussion was established to consolidate the Dutch activities. This restructuring was to ensure that the Dutch management would be less fragmented and that the board of directors of Philip Light Bulb Factory, Inc. would judge the Dutch activities just as neutrally and objectively as those abroad. As an illustration: In September, Philips numbered 344,600 workers altogether.

Otten: "Wouldn't a separate Dutch B.V. lead to a more detached attitude by the board of directors with respect to the Netherlands and thus be harmful to the Dutch employees? This question was also posed by the trade unions at the time. But now people view this positively. Now, there is a Dutch general management that stands in the breach for Dutch concerns. The relationships are cleaner. And the unions have a clearer interlocutor."

Last year, the operating results for Dutch Philips were still negative: minus 52 million guilders. The net loss, resulting after deduction financing costs, was even greater. In 1982, the entire concern obtained

a positive result of 2,130 million guilders. After deduction of financing costs and taxes, the concern's profit at that time was 472 million guilders.

Calje: "Are things going better for Dutch Philips in 1983?"

Otten: "During the first nine months, the operating results were positive again. The profit after deduction of financing costs, however, is still negative. The results are thus still absolutely insufficient. Our goal is a profit of a sure three percent of the sales, after taxes."

Calje: "Why is Philips suffering losses in the Netherlands?"

Otten: "The wage costs are still too high, and because the Netherlands function as a knowledge center for Philips. Philips invests relatively much in the Netherlands, in research and innovation. True, you can say that as far as wages are concerned, there is talk of moderation, but the effect of this on the competitive position is being partially undone by the devaluation of the guilder."

Calje: "Philips imports into the Netherlands total 6 billion guilders and its exports total 10 billion guilders. How can a company with an export surplus of 4 billion guilders still suffer losses?"

Otten: "Because the production costs are still too high! Formerly, Philips exported chiefly goods from the Netherlands. Now, an important part of the exports consists of services, in the form of knowledge."

Calje: "Isn't the conclusion obviously that the knowledge is priced too low? Couldn't Dutch Philips indeed make a profit with higher prices?"

Otten: "It's not as simple as that. You cannot just simply push a button. Many countries operate with legal rules. Abroad, one will wonder: What would it cost to carry out research here? We have to operate at competitive prices. Moreover, if we make knowledge too expensive, innovation is in danger. Then you start nibbling at the continuity."

Calje: "The government has come out with a tax-relief package of 1.3 billion guilders. The social security contributions for employers are going down by one-half, corporate taxes by 0.4 billion. Will this lead to more investments in the Netherlands by Philips?"

Otten: "Of real importance is the total business climate. Government measures alone are not directly decisive. Policy is, by definition, focused on the short term, expects results within one year. But that's not how it works. It took, in retrospect, an unimaginably long time before the deterioration of the business climate led to a sharp rise in unemployment. So, much time will also be needed before the better business climate translates into an economic upturn."

Calje: "What do you think of the lower corporate taxes?"

Otten: "People suggested: But you're suffering losses, so you won't be for a lower tax on profits. But we think that any entrepreneur who's worth anything can never be against a lower tax on profits. The reduction is thus structurally to be welcomed. Every entrepreneur must strive after profit."

Calje: "Doesn't your preference lie with lower social contributions, in order to depress your wage costs?"

Otten: "I want to say that we find the tax-relief package, as it now stands, a well-balanced package. You always have to seek a compromise: The one wants this, the other wants that. You cannot then start yanking at the compromise, then nothing turns out right.

"We do think that the manner in which the cabinet fleshed out the reduction in the social contributions is inadequate. Can you expand on that, Richard?"

Now, LL.M. R.J.A. de Lange, assistant social affairs director of Dutch Philips Industries, takes the floor: "With pleasure, Frans. In '82, a stabilization of the employer's social contributions was projected, but the result was a one-percent increase in the social contributions. A reduction for 1984 has now been promised, but we foresee merely a stabilization.

"The administration now wants to do away with the legal obligation to build up vacation days during illness. This measure acounts to a tax relief. But something like this has to be agreed upon in a collective labor agreement. When you do all that--which you can well imagine--then, in our case, this won't come up for discussion until during the collective bargaining for 1985. For 1984, then, this measure will yield nothing. Another complaint concerns the contributions under the health insurance law: The decline in contributions benefits only the smaller concerns that aren't 'private risk-bearers'!"

Otten: "It remains, moreover, to be seen what will happen with the suprastatutory benefits, such as the pensions and the supplement to disability benefits. If the AOW [General Old Age Law, i.e. retirement pensions] and the WAO [Law On INsurance Against Work-Related Disability, i.e. disability benefits] go down, then the suprastatutory benefits can lead to an increase in costs."

Calje: "What will Philips do if the net profit increases? Will that lead to more investments or to a strengthening of your capital position?"

Otten: "Our own capital doesn't need to be increased per se, since the foreign capital still lies below the limit we consider acceptable (59.3 percent of Philips' total capital consists of foreign capital, Kees Calje). We want very much, however, to strengthen the position of the supplier of risk-bearing capital."

Calje: "Are you striving for a dividend increase?"

Otten: "I prefer to make no statement about that now."

Calje: "Do you have new capital-stock issues in the works?"

Otten: "Whether such a new issues comes out depends, among other things, on the stock's quotation. One thing is certain: We won't come out with new issues simply because of government measures."

Calje: "You said, at the beginning of our conversation, that the competitive position of the Netherlands has been hurt by the revaluation of the guilder. Has the Dutch Bank, in your opinion, let some chances to keep the guilder cheaper slip by?"

Otten: "Without the revaluation of the guilder, the Netherlands' competitive position would have been improved, thanks to the moderation in wages. But it is, of course, unfair to say that the Dutch government can keep the guilder cheap on its own. When France devalues the franc, the guilder automatically becomes more expensive.

"We have been saying for years that the strong position of the guilder is not an expression of the strength of our competitive position, but a consequence of the natural gas. If natural gas exports drop off soon, what then will happen with the guilder? In addition, you can imagine that the government's heavy recourse to the capital market, and the rise in interest rates that results from this, is a bad thing for Dutch industry."

Calje: "Last March, President Lubbers chose to revalue the guilder not by five percent, like the German mark, but by three percent. That led to protests by President Duisenberg of the Dutch Bank, who was afraid that international trust in the guilder would be damaged, whereby interest abroad in government loans would decrease. Did Philips take sides in this dispute?"

Otten: "We were, in fact, not consulted. Lubbers' decision did indeed go in the direction we wished. Certainly."

After the talk with Otten was over, I continued talking with LL.M. de Lange. He gave words to the displeasure at Philips concerning deregulation. The proposals of the Van der Grinten commission were put on ice by the bureaucrats, as the complaint goes.

De Lange: "Take the dismissal rule. That could very well be made more flexible. But indeed, even the routes of appeal the rules have created cannot be done away with. Still, you might expect that, at the least, things that haven't happened yet would be viewed critically. The law concerning disclosure of incomes, for example, which is impracticable for Philips."

Calje: "Is Philips, in principle, against making incomes public?"

De Lange: "No, the principle of disclosure is not the point of the discussion. It's not taboo. But if one wants to develop one system for evaluating functions for all of the Netherlands, then we say: That's impossible."

The law in the works concerning work for the handicapped also runs up against complaints at Philips. De Lange: "The entrepreneur must be free. Of course, it strikes one as nice to take on more handicapped workers. But you have to avoid coercion, otherwise you wind up with such a stigmatization."

Calje: "How does Philips stand vis-a-vis the salaries for civil servants?"

De Lange: "The government's financial deficit and the collective tax-burden must go down and so measures are necessary. How you then moderate the civil servants' salaries and the benefits, that's the government's responsibility. Philips doesn't enter into that."

Calje: "Has Philips suffered harm from the lawsuits?"

De Lange: "We've suffered harm. But I cannot name a precise figure."

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SCIENTIFIC AND INDUSTRIAL POLICY

DUTCH GOVERNMENT EXPANDS FUNDING FOR INFORMATION TECHNOLOGY

Rotterdam NRC HANDELSBLAD in Dutch 17 Jan 84 pp 1, 15

/Article by editor Wilma Cornelissen: "1.3 Billion Stimulus For Information Science and Technology"/

/Text/ The Hague, 17 January--The cabinet will put circa 1.3 billion guilders into the promotion of information science and technology in the next 5 years. For up to 1988, 640 million had been earmarked to step up activities in research and education in this field and to stimulate the market sector. The ministers of Education, Economic Affairs and Agriculture want to add the same sum again to this.

So write Minister Deetman (Education, Van Aardenne (Economic Affairs) and Braks (Agriculture) in the Plan For Stimulating Information Science and Technology that Deetman, as coordinating minister for scientific policy, published today. The lion's share of the extra 640 million comes from Economic Affairs, which is putting 250 million more into stimulating the information technology industry, 55 million into research and 57.5 million into education. Minister Deetman is providing a contribution of 157.5 million for education and 72.5 million for research.

New is the contribution by the Ministry of Agriculture: 5 million for education and 37 million for research.

The ministers write in the note that the Netherlands must make better use of its opportunities in the area of information technology. To do this, rapid changes are necessary in education, research and the market sector. Schooling, training and development of knowledge will form the basis for this. In addition, the Netherlands must better utilize its advantages, such as the presence of internationally prominent equipment suppliers.

In the market sector, the ministers want to expand the stimulation policy to the middle-sized and smaller concerns. Guidance and supportive research will have to play a role in this.

Strengthening the market position of advanced Dutch firms like Philips and Oce and of the many smaller firms active in the area of information technology, telecommunications and computerization can be realized through developments in

the software sector that can be directed towards areas that are, on the basis of available knowledge, promising for our country and through better cooperation between research centers and industry.

Along with this, the industrial structure will have to be reinforced by attracting establishments by foreign concerns and by stimulating research by these firms.

Vocational Education

The priority in education is being given to vocational education. In lower, middle and higher vocational education, the new policy's accent is above all on the applications of information science and technology. In addition, an expansion of the citizen's information technology project is being sought, in which apprentices in the first phase of secondary education learn about computers and how to use them. Information science and technology will, furthermore, be introduced as an examination subject in the higher classes. As far as elementary education is concerned, the ministers emphasize developing opportunities the computer offers for special education and the accompaniment of children who cannot keep up with instruction.

The strenghening of research in information science and technology will be both purely scientific and application-oriented.

An exploratory commission for information technology research will have to advise the minister about this over the next 4 years. Finally, the Plan For Stimulating Information Science and Technology points out the market the government forms in the information technology sector. As one of the largest data processing sectors, it spends 1.5 billion guilders annually on computerization. (Including semigovernmental expenditures, circa 3 billion.) These expenditures grow by approximately 10 percent annually. The ministers think it is necessary to improve this market's visibility and to involve industry more in the investments that are made. Furthermore, the possibility of transferring this to the private sector must be looked into.

The policy intentions contained in the note will have to be worked out in a definitive policy plan in March 1984.

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SCIENTIFIC AND INDUSTRIAL POLICY

EDITORIAL COMMENTS ON INFORMATION TECHNOLOGY FUNDING

Rotterdam NRC HANDELSBLAD in Dutch 19 Jan 84 p 7

/Editorial: "Information Science and Technology"/

/Text/ A world full of videoscreens, keyboards and machines that perform time-consuming and complicated calculations for us and that collect and store information for us, while we comfortably listen to Bach or read Biesheuvel. Whoever envisions this picture, as he reads that three ministers are going to fraternally pump 1.3 billion into a plan for stimulating information science and technology, can go ahead and turn in for the night. That's not how things will turn out.

The extra injection of circa 630 million guilders, which the collective ministers are pumping into information science and technology and of which 250 million is going to the market sector and the rest to education and research, will not change the Netherlands into a leading computer nation. It is rather a just attempt to make up the Netherlands' lag vis-a-vis Japan, America and Canada.

Whether the injection will even bring that goal within range is to be doubted. The 250 million more to stimulate development, production and application in the modern microelectronics industries is a modest extra. Minister Van Aardenne had it written into the note that this money is chiefly intended for guidance and education for industry, whose acquaintance with and utilization of the possibilities is insufficient, and for supportive research to inspire more applications. For all the policy that there already was, a little more money is becoming available. The only news is the 10 million per year that's being freed to recruit establishments by foreign firms. A good idea.

Priority is clearly being given to education and research in the area of information science and technology, and that was needed. The lag we have in the education field, even with respect to our European neighbors, bodes little good for later on. Education and research will have to create the possibilities our information technology needs to ever be able to grow. That the priority lies with vocational education and not with learning with and through computers seems to follow logically from this.

It is also a somewhat bitter necessity: In order to give instruction with computers, programs are needed and we have scarcely any. On this point,

Minister Deetman wants to paste together all the scraps there are. Whether that will be sufficient, remains to be seen. A consolidation of forces yields no combat-ready army, if the forces are weak and little developed.

All hope is fastened on industry, which until now has tackled the development of computer programs for educational use on a modest scale, but which would certainly double its efforts, if the educational market has the money at its disposal to purchase the programs and first of all, of course, the equipment they fit. Of the ½ billion that Deetman is pumping to research and education, more than half will be put into equipment.

The research component of the plan, which is above all testimony that necessity is the mother of invention (attracting foreign researchers were necessary; releasing Dutch scientists from their teaching duties), is the best proof of previous cabinets' neglect. The plan, based on proposals of the software-development working group and the Quantum Science Corporation, is both fundamental and application oriented. There is also an exploratory commission for information science and technology that will have to furnish suggestions during the next 4 years.

Better late than never, we have to think, and that is true as well for the insight--not worked out in the note--into the market for manufacturers of information technology that the government constitutes. Governmental and semi-governmental purchases of data-processing equipment together amount to 3 billion annually. Involving private industry in this, as has also happened elsewhere, can without doubt have a stimulating effect. Only, something more is needed for this than launching an idea.

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SCIENTIFIC AND INDUSTRIAL POLICY

DUTCH GOVERNMENT TO FUND INFORMATION TECHNOLOGY DEVELOPMENT

Rotterdam NRC HANDELSBLAD in Dutch 18 Jan 84 p 9

[Article by Zeger Luyendijk: "Government Wants to Give Push to Information Technology With 'Catch Up Operation'"]

[Text] The Hague, 18 January--Of the four main areas of the draft plan for the stimulation of information theory, the Ministry of Economic Affairs (EZ) is taking responsibility for the part dealing with the "strenghening of the market sector."

Over the coming 5 years, EZ wants to earmark 830 million guilders for this strengthening program. The lion's share of this--710 million guilders--will be spent on development and supportive research.

EZ will spend approximately 80 million guilders on the strengthening of the domestic and foreign market position of Dutch information technology producers; EZ plans to spend around 40 million guilders on the strengthening and expansion of applications of information technology products by the Dutch business world. It is clear that the three named items form the main features of the EZ policy for the strengthening of the information technology sector.

It is not odd that EZ is participating in the plan for the stimulation of information theory, Minister of Economic Affairs Van Aardenne explained yesterday in the presentation of the draft memorandum.

The plan for the stimulation of information theory is an important step in the "Second Track" of industrial policy: renewal of Dutch industry. One way to achieve this is for industry to adapt to new technologies, as formulated by the Advisory Commission on Progress in Industrial Policy, better known as the Wagner Commission.

Use should be made of domestic potential for know-how, Van Aardenne said. The market sector will have to intertwine with education. The plans are a "catch up operation," Van Aardenne said. In the United States the number of jobs in the information sector is rising sharply, and according to the minister, there is no reason why that is not also possible in the Netherlands.

The EZ part of the draft memorandum begins with a portrait of the production side of information technology in the Netherlands. Aside from two large Dutch producers, Philips and Oce van der Grinten, that portrait is composed of approximately 300 small to medium-sized producers of microelectronic products, approximately 600 small to medium-sized computer software and computer service offices and 100--mostly small, according to the report--engineering offices and consulting firms.

In addition, there are subsidiaries of several foreign producers of information equipment in the Netherlands.

In the memorandum, the inconsiderable extent of Dutch business is attributed to a too small domestic market, the problems of attracting investment capital and the lag in government orders. Information technology industries abroad benefit much more from government orders, the memorandum points out.

Realizing

The government says that it is realizing its potential power for carrying out a vigorous policy of stimulation in the area of information technology. At this point, the government and government-related agencies are spending approximately three billion guilders a year on automation. Only 20 percent of this goes to the purchase and maintenance of software and hardware; the government spends the remaining amount on "management activities." According to the government, however, the efficient implementation of its potential power demands scrutinous preparation.

A small group of experts will soon have the task of elaborating into a plan of action the wishes of the administration to better attract the business world to information system projects within the government, as well as elaborating the possibilities of handing over to the private sector technical and scientific automation projects under government management, all within 6 months.

According to the memorandum, the development of advanced systems is being carried out in a limited number of--mostly large--companies. Elements of microelectronics, information theory and telecommunications are being combined into new systems. This work appears to be based to a relatively inconsiderable extent on research work in institutions for scientific and technological research. There is a desire at these institutions as well as in the firms to make more efficient and effective use of one another's possibilities.

Small and medium-sized firms are doing little research and development work themselves, especially in the software sector. In its plans to increase its financial aid to the information sector (approximately 50 million guilders a year), the government is giving priority to small and medium-sized businesses, especially in areas in the software sector which are promising for the Netherlands. At this point, there is a temporary stimulation measure in effect for the software sector in the form of the ASCI-85 program, which is based on research done in 1979 on the prospects of the computer service sector.

Strengthen

The position of the advanced firms based on the Netherlands will be strengthened, the draft plan for the stimulation of information theory continues. Intended here are activities in addition to development, "through which a more integral approach to the projects is possible," according to the memorandum. There will be an attempt to involve Dutch branches of foreign companies in this policy. Developments at ITT and cooperative connections like the one between Philips and Siemens will be encouraged.

The establishment of foreign information technology producers in the Netherlands will likewise be welcomed. One of the benefits is a vigorous boost for the international orientation of the Dutch business world. These companies are also capable of beginning projects which would not otherwise get off the ground, according to the memorandum.

"In the programming of market-oriented developments, thorough information on international developments in the area of information technology is necessary," the draft memorandum states. The stimulation plan indicates that "imports of know-how" and information supplies will be strengthened by so-called "reporter missions" abroad by the scientific as well as the business world, and by reemployment of Technical Science Attaches.

Software

Further research will be done on how software developed at scientific institutions can be carried over to businesses.

The applications of information technology by businesses will be stimulated by demonstration projects (EZ is now spending 7 million guilders on this), the establishment of infrastructural provisions (like, for example, the two-way cable experiment in Limburg), and stimulation of small companies by TNO [Dutch Central Organization for Applied Natural Scientific Research] and the center for microelectronics.

The application of information technology products is especially important for small and medium-sized companies, because they could lose their competitive position on the foreign market. The budget for the stimulation of applied projects amounts at present to 30 million guilders a year, but that will rise to 40 million guilders.

Stipulations

In the draft plan for the stimulation of information theory, the government indicates that the policy entails stipulations. Self-initiative by the companies as formulated by the Wagner Commission is emphastically at the top of the list, according to the memorandum. The business world is urgently called upon to come up with concrete project proposals. But the government will also act as a catalyst to get projects off the ground. Informal consultative groups can play an important role.

The government says that it will give material support in the form of development credits, innovative government procurement, goods "made to order" for large projects and subsidies for research and feasibility projects. The government will give immaterial support by removing legislative obstacles, making know-how available, introducing international projects (ESPRIT), devoting government needs.

12271
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ANVAR IN FRANCE ANNOUNCES BUDGET, GOALS FOR 1983-84

Paris AFP SCIENCES in French 19 Jan 84 pp 1-4

[Article: "ANVAR Is Managing Billions."; passages enclosed in slantlines underlined]

[Text] A total of 8 billion in state financing for 1983 and 1984 to modernize companies, and 1 billion francs per year to help companies, laboratories and self-employed individuals innovate will be distributed--and managed--by ANVAR, the National Agency for the Implementation of Research, it was announced at a press conference on 17 January by Mr Christian Marbach, ANVAR general director.

A new task--and not a small one--was added to the ANVAR missions: that of managing loans from the Industrial Modernization Fund (FIM) created last September to help sound firms modernize. According to Mr Marbach, by the end of 1983, FIM loans amounting to 960 million francs were approved, and loans worth another 2 billion francs are being processed and should be allocated during the next two months.

At least 8 billion francs will be allocated by the FIM to companies in 1983 and 1984, and "this may not be enough," Mr Marbach pointed out, indicating that some 100 applications per month will be processed by ANVAR in this context.

To go into details, of all the operations approved by the FIM in 1983--amounting to 961.10 million francs--47 were "technological participation loans" amounting to 430.10 million francs (19 loans made under the national procedure, and 28 under the regional procedure) and 15, amounting to 531 million francs, took the form of leasing operations. One hundred and fifty-nine applications for technological participation loans are currently being processed as well as 4 loans to leasing companies.

The FIM money which, at first and for a total of 3 billion francs, was lent by the Deposit and Consignment Office, must now be provided by savings deposited into CODEVI accounts (Industrial Development Savings Accounts) into which over 50 billion francs were deposited by the end of 1983.

Thus, aid to innovation--the major task of ANVAR from late in 1979 to late in 1983--will represent over 1 billion francs in 1984. According to Mr Marbach, next to the "traditional" aid to innovation, which in most cases takes the

form of an advance to be repaid in case of success, there will now be an aid for "recourse to services" whose general characteristic is to encourage those who receive it to have recourse to outside consultants to solve their innovation problems. Among other things, this aid includes aids to the creation of enterprises.

/From July 1979 to 31 December 1983, ANVAR made 5,374 grants to aid innovation, amounting to a total of 2.8 billion francs/ (exclusive of grants to the young and to independent inventors).

The total amount repaid since the creation of the grants to aid innovation was 78.9 million francs. /A study of the cases in which repayment was made revealed that each 100 francs granted already had generated an average of 635 francs of revenue./

Certainly, there have been failures, but they are relatively few. For instance, for the 1,175 technical programs completed in 1982 (out of a total of 4,038 applications approved as of 31 December 1982), there were 151 failures, including 41 technical failures, 51 commercial failures (the product was no longer competitive when the implementation stage was completed) and 59 liquidations.

We should also add the grants (45 in 1983) given by ANVAR to independent inventors and those it gives to educational programs (PAE) plus its summer grants and its grants to higher-education innovation programs (APIES), all ANVAR programs involving the young. Last year, there were 322 such grants.

Concerning more particularly the research implementation activities of ANVAR, Mr Marbach indicated that, in 1983, 351 new research grant applications were considered at the request of the organizations involved, i.e. an increase of 24 percent over 1982. One hundred and twenty new contracts were signed, including 55 licenses with manufacturers and 27 cooperation contracts.

/In 1984, Mr Marbach announced, ANVAR will start a new procedure to "identify in organizations or laboratories the results that can be implemented."/

The innovation subsidy which was just abolished (and which had made it possible to distribute 46 million francs in 4,500 subsidies) is now replaced by a 25 percent tax credit to be applied to the research effort made by industrial and commercial firms. This new procedure may give a better idea of the research effort accomplished by companies.

Many other operations are carried out or launched by ANVAR, which was created 15 years ago and whose personnel has remained stable around 400 people, 200 of which work in the provinces. ANVAR is increasing its efforts to decentralize; in particular, it is increasing its summer grants to make the young aware of innovation, and it is encouraging the emergence of new technologies for the economic development of Third-World countries, etc.

As far as /decentralization/ is concerned, we should note that each regional delegation is assisted by an orientation committee consisting of manufacturers (30 percent), researchers (21 percent), bankers, counsultants (19 percent),

Table 1. Implementation - 1983 Statistics

New applications filed in 1983		351
- National Center for Scientific Research and associated laboratories	229	
- Universities and higher schools	58	
- Technical centers	6	
- National Institute for Health and Medical Research	32	
- Other public organizations	26	
Patents taken in 1983		897
- New patents applied for in 1983	126	
- France	119	
- Foreign countries	7	
- Foreign patents applied for based on previous year priorities	771	

Table 2. 1983 Regional Grants - Breakdown by Organization

Organization	Percentage
- National Center for Scientific Research's own laboratories	10.2
- National Center for Scientific Research's associated laboratories or teams	32.8
- Universities	28.5
- Higher schools	10.9
- Dedicated research organizations	4.4
- National Institute for Agricultural Research	1.5
- National Institute for Health and Medical Research	1.5
- Technical centers	5.1
- Miscellaneous	5.1
	100.0

University laboratories and laboratories of the National Center for Scientific Research therefore account for 71 percent of all grants given.

union members, elected officials, regional personalities (18 percent), administration representatives (12 percent). Veritable think tanks, the orientation committees provide the agency with advice on how to improve the dissemination of innovation and, now, promote modernization.

Decentralization made it possible for ANVAR to be represented in close to 200 regional events and, in 1983 alone, to disseminate knowledge about close to 500 new products and processes at shows (Innova, SITEF [expansion unknown], Biosciences) thanks to a well-designed travelling exhibition produced jointly with La Villette and also through its publications: the COURRIER DE L'ANVAR and the MDI [expansion unknown].

Finally, ANVAR is playing an important part in the regions, in bringing innovators and bankers in touch.

9294
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FRENCH INDUSTRIAL DEVELOPMENT FUNDS: COLLECTION, DISTRIBUTION

Paris L'USINE NOUVELLE in French 22-29 Dec 83 pp 24-26

[Article by Marie-Jeanne Pasquette]

[Text] When Jacques Delors and Laurent Fabius set up the Industrial Development Account (CODEVI) last July they did not foresee that savers would develop such a passion for the French industry. At the time it seemed reasonable to bank on collecting around 10 billion francs with half of that sum going to the Industrial Modernization Fund. Funds collected to this date amount to more than 40 billion francs and they are likely to reach to 60-million mark before the end of 1984.

The CODEVI funds destined to be pumped into the industry are low-cost savings which, starting on 1 January next, will be made available to the industry in various forms.

The Industrial Modernization Fund will distribute more than 5 billion francs worth of loans to the industrial sector to finance modernization projects (see article by Alain Pauche). It will obtain these funds from the Deposit and Consignment Bank which have received them from the institutions where CODEVIs are collected.

Savings Banks, Treasury accountants, Postal Savings Banks and Municipal Credit Banks will turn over to the Deposit and Consignment Bank 100 percent of the CODEVI funds collected. Banks, Regional Farm Credit Banks and other groups of mutual societies are also expected to surrender to that bank part of the funds collected. Banks and Regional Farm Credit Banks (members of the National [Farm Credit] Bank) will surrender 50 percent; the mutual societies, 80 percent. These percentages, however, remain very controversial.

Jacques Mayoux, president of the company, considers that such transfer represent "a withdrawal of banking resources which could be dangerous." He would like the banks to be allowed to keep 80 percent of the CODEVI savings. Likewise rather than the 50 percent planned. Theo Braun, president of the National Confederation of Mutual Credit, thinks that the banks of the mutual system should be allowed to keep at least 50 percent of the CODEVI funds collected as other banks are now allowed to do.

Even though the financial institutions have not officially announced the exact use to which these CODEVI funds will be put, it is now certain that these funds will replace the loan packages usually released by the government.

More Substantial Bank Loans for the Industry

In the banks, the CODEVI loans will replace, starting on 1 January, long-term banks loans to the industry and certain loans to craftsmen.

In addition to the industry, these loans will also benefit other sectors of activities such as transportation, industrial services and even the building and public works sector.

The loans will be used to finance productive investments (productive in a broad sense) including 100 percent of the need for working capital generated by the investments. They could also supplement the loans of the Industrial Modernization Fund. The loans will be for a period of 2 to 15 years with an allowed rate of interest which can go as high as 10.75 percent for medium-term loans (less than 7 years) and 11 percent for longer loans. The total package of these loans will amount to 50 percent of the CODEVIs collected by the bank, or around 10 billion francs, by the beginning of 1984. This figure is much higher than the loan packages previously issued to industry by the banks and which the government has discontinued in 1984.

The Regional Credit Banks (members of the CNCA [National Farm Credit Bank] have "collected" over one-fourth of the total amount of CODEVI savings. The Ministry of Agriculture has issued a circular specifying how the remaining 50 percent of the funds deposited with the Farm Credit Banks must be used.

The regional banks are given three choices: they can give loans to PME [small and medium-size business] and to PMI [small and medium-size industries] in the rural sector (rural districts of less than 65,000 inhabitants and businesses employing less than 500 workers); to businesses in the agricultural and food sector, or to finance the modernization of farming concerns. In January 1984, this package of loans could represent between 5 and 6 billion francs. Starting on that date, the new CODEVI loans will replace normal medium-term loans (MTO) at a discount rate of 11 percent which totaled 4.3 billion francs in 1983.

Long-term credit institutions (of the National Credit and CEPME [expansion unknown]-type) will also become recipients of some CODEVI savings. The Savings and Providence Banks can choose to allocate 20 percent, or some 1.6 billion francs, of their CODEVI savings to these institutions. We still don't know where these funds will go.

Another possibility is that, given the large amount of CODEVIs paid into the Deposit and Consignment Bank (close to 24 billion francs), the government could decide to earmark part of that sum to finance the yearly loan package of long-term credit institutions (29.5 billion francs in 1983). As a matter of fact the CODEVI savings are inexpensive savings (7.5 percent) for these institutions compared to the issue of binding loans often subscribed in foreign markets.

[Article by Alain Pauche]

[Text] The Committee of the Industrial Modernization Fund [FIM[, which has the task of granting loans called "technological participatory loans" to businesses submitting definite projects of modernization and loans to lend-lease companies, is meeting today for the fourth time since its creation last September. As it does every month, the committee will select projects costing less than 5 million francs which have been reviewed by the ANVAR [National Agency for the Implementation of Research] and projects costing more than 5 million francs studies by the Ministry of Industry.

Twenty Projects Projects of More Than 5 Million Francs

Five files are expected to be selected today. This will bring to 20 the number of projects costing more than 5 million francs that will benefit from loans under the new FIM system. This system has a double advantage: the loan interest rate is fixed at 9.75 percent (for 1983) for a period of 7 to 10 years with a deferred payment period of up to 2 years; because it is a low priority debt, that type of loan is comparable to the enterprises's own funds. At a regional level, the ANVAR offices charged with the task of selecting projects of less than 5 million francs have selected around 30 enterprises. But some 100 files are "in the pipeline" (40 on a national level). Finally, the FIM has set a ceiling for the loans to be given to some 10 lend-lease companies.

These scarce figures which the FIM, like its predecessor the CODIS [expansion unknown], is unwilling to divulge (businesses are assured that their files will remain confidential) are nonetheless revealing. They indicate that the companies have prepared convincing files which meet the FIM's main criteria: introduction of new technologies alongside with improved productivity and quality. They also show that many projects of a certain scale exist which leads the government to think that "the potential for investment" is merely waiting for better profits, providing that the interest rates are attractive and the procedure is uncomplicated and flexible.

But due to the lack of details, these figures are not sufficient to assess the activity of the FIM in 1983. This, from the financial viewpoint as well as from a sectoral and organizational viewpoint.

The loans issued on 1983 will probably amount to less than 3 billion francs. In 1984 the FIM can expect to count on "at least 5 billion." Which is not much given the volume of funds provided by the CODEVI savings (see article by Marie-Jeanne Pasquette) and the amount of public aid and special loans given to industrial enterprises (95 billion francs in 1983). Therefore the president of the FIM, who is the minister of industry, will have to recover as much money as possible and, at the same time, he must urge the minister of economy to "advise" the banks to issue loans to industrial enterprises wanting to modernize.

Fifteen Hundred Projects Being Studied in 1984 According to ANVAR

A debate on the subject of how to allocate the CODEVI funds has started and, because money is scarce, it will not end soon.

Three-fourth of the projects reviewed by the FIM fall under the heading of productive projects. This means that until now there has been no deviation from the right course. These projects are submitted by medium and large-size enterprises. Only one application has been accepted from a subsidiary of a large state-owned company. But according to a close associate of Laurent Fabius, one should not be surprised if industries which are the focal point of international competition, such as the automotive industry, were attracted by FIM loans. This is an oblique way of confirming that Renault and Peugeot have projects. Is it not a fact that the production of vehicles with low fuel consumption is one of the priorities of the FIM? It would be equally surprising if the government were not planning to reduce the state budget by finding other means of financing investments in the nationalized sectors.

One of the aims of the FIM is to shorten to 6 weeks the time required to review a file. A bold attempt which is likely to succeed. For instance, a few weeks ago Pompes Guinard (of the Leroy-Somer group) obtained a supplementary loan of 15 million francs within a period of time close to the time limits advocated by the promoters of the new system. This FIM loan "put the finishing touch" to an ambitious investment program worth 135 million francs over a 3-year period.

The project of Pompes Guinard could eventually become a "showcase" for the FIM. The project involves the automation--mainly the installation of flexible workshops-of its three plants in the Indre Department, the plants of Chateauroux, Neuvy-Saint-Sepulchre and Le Pechereau. It requires medium and long-term investments to modernize the production process and to ensure increased production: in the Neuvy-Saint-Sepulchre plant, manufacturing household pumps, production will jump from 200,000 pumps a year to 500,000 by 1985. The project combines loans from the National Credit Bank, participatory loans, an FIM loan and contributions from the shareholders in the form of a capital increase. This project also shows that the FIM does not intend to finance an entire project except in special cases.

With the pace at which files are coming, the ANVAR thinks it will have to review 1,500 files in 1984. That is a very large figure given the evaluation personnel available to the ANVAR and to the services of the General Directorate of Industry in the Ministry of Industry.

"Flexibility, fast work and efficiency are the characteristic features of the procedure followed to allocate FIM loans, in sharp contrast to the method used to assign public funds, "notes Laurent Fabius. Many company directors will pass judgement on the government's industrial policy on the basis of how fast the operation of redirecting funds to the industry can be carried out. Their evaluation is important because it can contribute to their investments by the end of 1984.

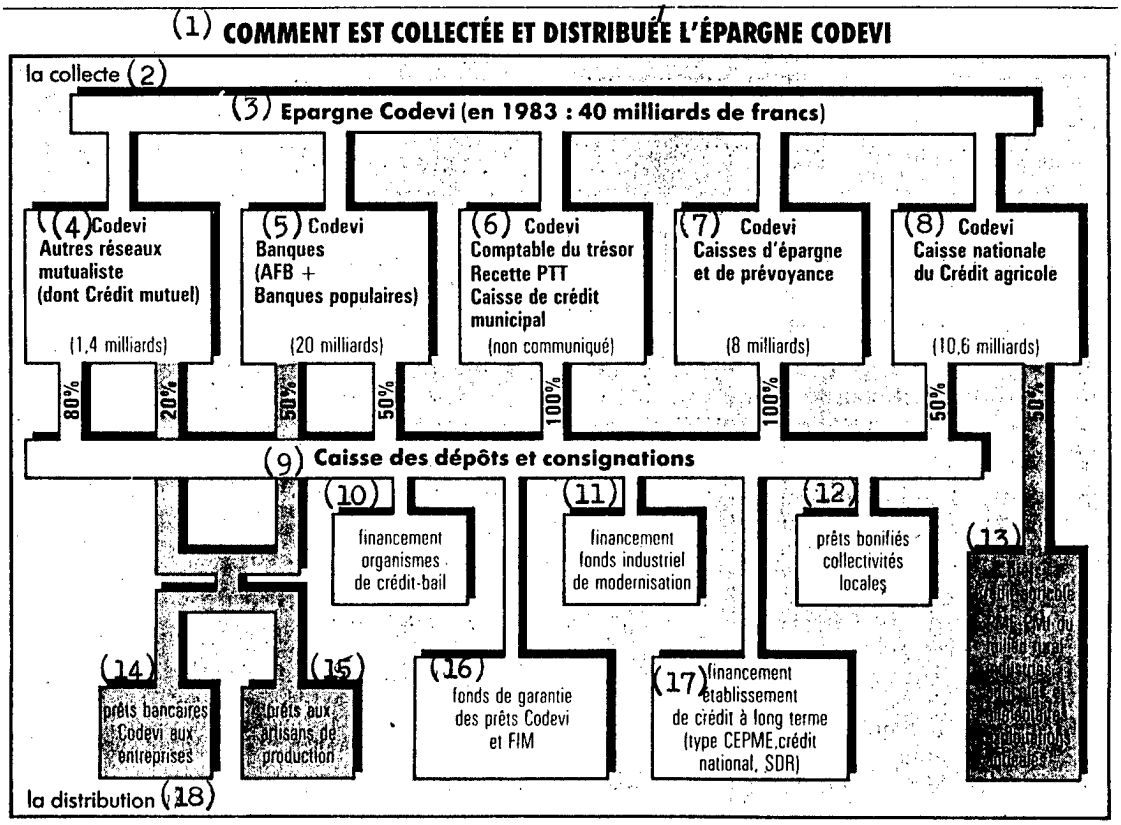

Chart: The distribution of CODEVI savings, as it stands now, could undergo changes. Banks in particular would like to keep 80 percent of the funds collected instead of 50 percent as planned.

Key:

1. How CODEVI savings are collected and distributed
2. Collection
3. CODEVI savings (in 1983: 40 billion francs)
4. CODEVI, other mutual networks (including Mutual Credit) (1.4 billion)
5. CODEVI, banks (AFB + Popular Banks) (20 billion)
6. CODEVI, Treasury Accountant, PTT Savings Bank, Municipal Credit Bank (not available)
7. CODEVI, Savings and Providence Banks (8 billion)
8. CODEVI, National Farm Credit Bank (10.6 billion)
9. Deposit and Consignation Bank
10. Financing lend-lease institutions
11. Financing Industrial Modernization Fund
12. Discount loans to local communities
13. Farm Credit Loans, PME & PMI in rural sector, agricultural and food industries, agricultural concerns
14. CODEVI bank loans to enterprises

15. Loans to production craftsmen
16. Guaranty Fund for CODEVI loans and FIM
17. Financing long-term credit institutions (such as CEPME, National Credit, SDR)
18. Distribution

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SCIENTIFIC AND INDUSTRIAL POLICY

RIESENHUBER, LAMBSDORFF CLASH OVER FUNDING FOR FRG RESEARCH

Research, Economic Ministries Overlap

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 3 Jan 84 p 9

/Article: "Research Support Coordination"/

/Text/ There is intensified criticism in the FDP fraction about the fact that national research support is not adequately coordinated. It is reported that undesirable overlaps are developing between research support measures by the minister for research and the minister for economics. The Ministry for Research, with its new programs, is competing with the Ministry for Economics. While Research Minister Riesenhuber has financial latitude for new programs, Economics Minister Lambsdorff's research has been trimmed by the budget committee. Thus, the program in the Economics Ministry, from which subsidies for the personnel costs for research and development in small and medium enterprises are paid, was cut.

Helmut Haussmann, economic policy spokesman of the FDP fraction, very much disputes Riesenhuber's right to market-near research support which is not tied to specific projects (so-called indirect support). Haussmann demands that this market-near research must be concentrated in the Economics Ministry. Professor Karl-Hans Laermann, FDP research policy spokesman, refused to go that far. However, Laermann, like Haussmann, believes that organization reorganization for research support is essential. Laermann says that in the FRG there must be provision for more rapid transfer of the results of research and development to the market. The two ministries would have to come to an agreement as to how they could best provide assistance in this transfer process. That should be regulated as quickly as possible without competitive wrangling. Meanwhile, the two departments are striving for coordination. In fact, Lambsdorff and Riesenhuber have held two discussions.

Riesenhuber points to the fact that he found a work regulation in the Federal government which is justified on the basis of the actual situation. In Riesenhuber's opinion there is no other arrangement which would be better in view of the situation. The question of which research support measures would be assigned to which department is not a fundamental question, but rather a question of practical organziation. The Ministry for Research uses a large large number of research policy instruments and cannot do without market-near

indirect support. As an example of how different measures of support are combined in a unified design Riesenhuber mentions the four-part program for manufacturing technology. It consists of market-near support for manufacturers and users of manufacturing technology, of joint research between companies and scientific institutions and of a technology transfer program by which research results are to be put into practice more rapidly. And fourth, there are also research tasks which examine the economic and social consequences of the use of manufacturing technology (technology-assessment of consequences). Riesenhuber says that that is the ambition of the minister for research to expand such "specially designed support."

R&D Personnel Funds Cut

Duesseldorf VDI NACHRICHTEN in German 9 Dec 83 p 1

/Article: "Dispute Over Research in the Bundestag"/

/Text/ Funds for federal subsidies for personnel costs for research and development by enterprises are to be drastically cut in 1984. The Research Committee unanimously opposed this decision by the Bundestag Budget Committee (with the Greens abstaining).

In all, the funds of the Economics Ministry (BMWi) for research, development and innovation in the middle-level sector are to be cut, according to the plans of the Budget Committee, from DM468.4 million in 1983 to DM434.2 million in 1984, thus by 7.33 percent.

The minister for research repeatedly made an offer to the minister of economics to assume the personnel cost subsidies. Instead, Dr Helmut Haussmann, chairman of the FDP fraction's economic policy task force is now demanding that indirect research support again be moved to the BMWi. In contrast, SPD chairman on the Research Committee, Dr Ulrich Steger, is now demanding that the program of personnel cost subsidies be shifted to the minister for research.

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CSO: 3698/228

SCIENTIFIC AND INDUSTRIAL POLICY

SPECIAL DEPRECIATION ALLOWANCE FOR FRG R&D FIRMS

Duesseldorf HANDELSBLATT in German 13 Dec 83 p 7

/Article: "Definition of Sectors Deserving Subsidy Support"; for related article see JPRS 84782 No 165 of this series dated 18 Nov 83 pp 37-38/

/Excerpts/ The draft of a change in the income tax implementation regulation which was prepared by the Ministry of Finance contains details about the regulations provided for in the 1984 tax relief bill concerning special depreciation allowances for energy-saving measures and for research and development investments as well as for oceangoing ships and aircraft.

For research and development investments the draft regulation makes provision for allowing in addition to regular depreciation special depreciation allowances up to a total of 40 percent in the year of acquisition of manufacture and in the 4 subsequent years in the case of movable economic goods.

There is the requirement that the movable economic goods exclusively serve research or development in a domestic company for at least 3 years after acquisition or manufacture. In the case of buildings, including additions and expansion of existing buildings, parts of buildings and owner-occupied homes additional depreciation up to a total of 15 percent can be taken in the year of manufacture and in the 4 subsequent years if the buildings serve more than two-thirds research or development in a domestic company for at least 3 years. If the buildings serve research or development to a lesser degree, but more than one-third, the additional depreciation amounts to 10 percent.

The special depreciation allowances can be claimed for movable and unmovable economic goods and for expanded and newly-built building parts if acquisition or manufacture falls in the period between 19 May 1983 and 31 December 1989.

12124
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SS-20 PACKED WITH WESTERN TECHNOLOGY

Hamburg DER SPIEGEL in German 26 Dec 83 pp 60-65

[Text] The pilot was on board, the gangway had been pulled up. The MS "Elgaren" was ready to sail, when there was a flurry of activity on the Afrikakai of Hamburg harbor. A car with a blue light stopped, two men jumped out, ran onto the pier and boarded the ship with a search warrant.

The next day the Hamburg customs announced triumphantly that at the last minute it had intercepted an illegal consignment of US military computers, valued at DM 2 million, which had been destined for a recipient in the East bloc.

Until the middle of November this year, the impoundment on the "Elgaren" in Hamburg harbor was the biggest blow struck against the grey transfer of technology from the West to the East. But the triumph of the Hamburg customs men paled quickly in the face of an even greater success in the same affair by their Swedish colleagues.

On 20 November the "Elgaren" was searched once more in the port of Hälsinborg at the request of the US Department of Trade. The Swedish customs officers found four containers, which their colleagues in Hamburg had overlooked in the haste of their lightning nighttime action. The contents were: electronic data processing equipment valued at between DM 5 and 10 million.

The price says little about the utility value of the confiscated goods. The containers that were intercepted in Hamburg and Hälsinborg contained, among other things, two complete VAX 11-780 electronic data processing systems.

The system was developed originally for civilian use. It is not capable of being used for military purposes until two of these computers are coupled together with the help of a multiporter--also confiscated in Halsinborg.

Two VAX 11-780's then become one VAX 11-782, currently the most powerful computer that is suitable as a fire control system for nuclear missiles--provided that it is fed with the appropriate computer program.

The VAX-compatible software arrived a few days afterwards in Stockholm by air freight, and suitable accessories arrived by rail in Malmö. The electronic

brain had been delivered by the manufacturing company, Digital Equipment of Boston, Massachusetts, to South Africa, however not installed but shipped on to Europe. The shipper of the intercepted consignments was the Optotronix trading company, registered in Cape Town, the recipient was Integrated Time in Malmö, a subsidiary of Semitronic in Zug in Switzerland. This company in turn is a sister company of Techimex in Harmstorf (rural kreis Harburg near Hamburg).

The organizer of the zig-zag operation and the owner of the (non-American) companies involved in it is Richard Mueller, 42 years old, exporter, from Jesteburg in Nordheide, who has made a name for himself as a market leader in the relevant dealer scene. The state attorney's office in Luebeck has been looking for Mueller--in connection with another matter--since 15 December. Three of his closest collaborators have been under arrest since the middle of the month.

The management of Integrated Time has since let it be known that the data processing system impounded in Hälsinborg, Stockholm and Malmö had been intended for installation in a Swedish computer center in the Stockholm suburb of Taby. But director general of customs, Bjorn Eriksson, thinks the assumption that the consignment was intended for a final buyer in the East bloc is "not without foundation."

There is strong evidence for this assumption. The original packing material with the manufacturer's imprint, type designations and other identification marks had been removed. The bill of lading does not correspond with the content of the containers.

The most important piece of evidence is Richard Mueller himself. Mueller is regarded as the most successful representative of a species of traders who use the gradient between Western and Eastern knowhow to increase their prosperity and who are responsible for the Soviet Union, in spite of its structural shortage of breath, never falling too far behind in the worldwide arms race.

Without Western cybernetics weapons technology in the East bloc would be 10 years behind. Conservative advisor to the Pentagon Miles Costick is convinced that most of the important Soviet weapons systems are based on Western technology. Neutral observers are of the same opinion. Recently, at a seminar of the Friedrich-Ebert Foundation, Heinrich Vogel, director of the Institute for Scientific Eastern and International Studies in Cologne, figured the "proportion of illegally transferred Western technology in new military developments of the Warsaw Pact" at about 70 percent.

The Coordinating Committee for East-West Trading Policy (CoCom) in Paris, acting on behalf of NATO and Japan, regularly publishes list of technologically valuable goods, whose export to the East bloc is prohibited. But because CoCom lacks the power to enforce its resolutions and because national agencies prosecute offences against CoCom papers mostly as gentleman's violations or as irregularities, the embargo regulations are avoided everywhere in a confident manner.

The most spectacular cases in recent years were noted in, of all places, the United States--in the country whose CoCom lobby never tires of complaining about the loose secrecy policies of the partner in the alliance.

--US companies supplied to the Soviet Union receivers for the "Omega" navigation system of the US navy, with whose help submarines of the Red fleet can determine their positions worldwide with no difficulty.

--Spawr Optical Research Inc. in California sold watercooled laser mirrors to the Soviet Union, which are now considered the heart of prototypes of Soviet killer satellites.

--At the beginning of the year, Pentagon specialists found the exact copy of a valuable 5400 series microchip, which Texas Instruments manufactures for the US navy, in a Soviet spy buoy which was washed up off Rhode Island.

According to Miles Costick, even the feared SS-20 medium-range rocket is packed "full of Western technology." In the opinion of Western secret services, the Soviets constructed the guidance system with the help of IBM 360 and 370 computers. The computers were supplied to the East bloc by the German IBM subsidiary.

The Massachusetts Institute of Technology very probably developed the course computers for the missiles. The complicated Mirv type gyroscopic compasses, which guide the three nuclear warheads of the SS-20 independently of each other to different targets with an average deviation from target of 300 ms, work with the Bryant Centalign-B ball bearing system, which was patented in the United States.

Sometimes the Western manufacturers even supply maintenance service in addition to the smuggled computers. The distribution paths are so safe that the Soviets move defective computers out along the prohibited routes on which they come into the East bloc and move them in again after the repairs have been carried out.

In short: by spending a few hundred million dollars the Soviets have acquired strategic-technical knowhow for which the West has spent more than $100 billion in the last 10 years. And Richard Mueller from Jesteburg--West German investigating authorities are certain--profited from a good portion of these millions of dollars.

The FRG federal intelligence service, the CIA and the British Service MI-5 have only rough ideas of the extent of Mueller's transactions. As far as was known, only three of Mueller's consignments were caught in the net of the US and Western European customs authorities. Dozens, if not hundreds, went through.

The sales pattern was always the same. Only the shipping routes changed constantly. The goods were ordered from the manufacturer by one of the numerous Mueller firms and then sent on a zig-zag course around the world through third, fourth and fifth countries into the East bloc. Favorite transit

countries are Canada (because the export of US products to Canada is not subject to approval), neutral Switzerland and South Africa with its unusually liberal export regulations.

Only Mueller's way of life provides approximate figures about the size of his earnings. This much is certain: Richard Mueller was the richest man in Jesteburg. And Jesteburg, with its millionaire suburb of Bendestorf, is at least conjectured to be the richest community of its size in the Elbe country outside Hamburg.

A Bendestorf exporter, who was friends with Mueller for a time, estimates that he made DM 10 to 15 million in normal years--net. And as far as his business vita can be reconstructed, he has been in business for about 10 years.

When Richard Mueller moved into a modest single-family house on the Osterberg in Jesteburg in 1976, he didn't even have money for furniture. But then puzzling prosperity began to spread out around him, almost like an explosion.

He purchased a dream villa in the suburb of Wiedenhof and drove up real estate prices in Jesteburg by buying property indiscriminately. Because he found nothing suitable in Germany for the interior decor of his residenee on the Seevenweg, he bought an English manor house from the last century, had the interior torn out and rebuilt in Jesteburg. Because his wife loves to hear the rustling of beech trees, he had a full-grown copper beech flown in by a heavy cargo helicopter and planted in the garden in front of his house.

Mueller's greatest pride was the Trakehner stud farm Wiedenhof, which housed close to 100 throughbred stallions and mares in its days of glory. Cost was immaterial. He put a blank check on the table in front of a farmer who was pretending not to want to sell his favorite horse and invited him to enter an "appropriate sum." The farmer obeyed. Mueller had the horse.

But all the throughbred steeds--like the villa and the fleet of cars (Bentley, Jaguar, Porsche and Ferrari)--were nothing but the expression of Mueller acting to create an impression. Only his wife and head of the stud farm knew that he could not ride.

He also did not know how to sail and yet he owned one of the most splendid sailing yachts between Kiel and Stockholm, the three-master "Tonga," which he had bought from Prince Rainier of Monaco. In Jesteburg Mueller recounted that he had bought an island off the Swedish coast specially as an anchorage for the"Tonga."

It is certainly true that the "Tonga" often lay off the island of Björnö for months on end--within sight of the Muskö naval base, which is cut into the cliffs and off which the Swedish navy was hunting foreign submarines last year.

Wife Sieglinde also showed no inclination to conceal their new wealth. She started to collect expensive furs and took pleasure in paying for their morning rolls at the baker's with DM 1000 notes.

When the Muellers took a vacation the staff was always present. Once they rented a 24-meter motor yacht on the Cote d'Azur with a parking deck for the Porsche. Another time they chartered the entire first-class cabin in a Lufthansa jumbo jet for their safari vacation in Kenya. They were so thrilled by their holidays on the Seychelles that they immediately bought a house on the main island of Mahé, complete with palm tree-covered grounds.

Richard Mueller--by birth a Berliner with a Swiss passport--broke down the normally intact wall of distrust of newcomers on the Lueneburger Heide by acting the part of the extravagant Maecenas. He earned his money easily. But he also shared it easily. He nonchalantly threw a bundle of 50's over the fence to a group of children who were going through the village at Whitsun, singing and collecting money. At Christmas there was DM 5000 in cash for his employees, or even a new Rabbit as a bonus. In recent years Mueller purchased seven automobiles from local VW dealers as presents for his staff.

The philanthropists of the Waldorf school association today are still full of praise for Richard Mueller's generosity. Years ago he donated DM 1.6 million for a new building at the Rudolf-Steiner school in Hamburg-Harburg. There was almost a scandal at the dedication ceremonies when one of the attending guests jokingly said under his breath but audibly: "Old man Steiner would turn in his grave if he knew that the donation came from Moscow."

It never occurred to the residents of Jesteburg that "Money-Mueller," as they called him, could have come into his millions dishonestly. Mueller's contacts with the East bloc did not seem suspicious--because he never tried to conceal them. He frequently had visitors from Moscow, Budapest, Prague and East Berlin, he liked to tell stories in a social group about his numerous trips to the East bloc, about his participation in a Hungarian computer firm and about his apartment at No 46 Visegradenz in Budapest.

Neither the tax authorities nor the local administration found it suspicious that the new residents of Jesteburg drove automobiles with Swiss license plates for years, or that his employees received their salaries from Switzerland. A business tax assessment from the township of Harmstorf on Mueller's Techimex in the amount of DM 40,000 was dropped by the tax office in Buchholz. The reason given: Techimex had been operating for years without making a profit. Mayor Amandus Kaninck said: "He was living on his losses."

There was some surprise when Mueller departed somewhat hastily in December last year for South Africa. What the residents of the Lueneburger Heide did not know was: the decision for a move came immediately after the liquidation of the Gerland home organ factory in Moellin which Miller had saved from bankruptcy with DM 500 thousand 6 months earlier as the administrative counsel of the Swiss company Dan Control.

The Gerland partners, Roland Waidhas and Werner Schmidt, had had a falling out with their rescuer, because Mueller had turned the firm's range of offering inside out, in violation of their agreement. The new partner had had the organs pushed aside and moved large computers in to replace them. The computers--mostly from Digital Equipment--were packed into neutral boxes and

loaded at night onto trucks belonging to the East bloc moving companies Deutrans and Hungarocamion.

Within a period of a few weeks electronic equipment worth several millions was freighted into the East. Waidhas wrote down the license plate numbers of five convoys which left Moelln for Helmstedt.

According to the bills of lading, which Waidhas and his friends secretly photocopied, the shippers were Deutsche Integrated Time (owner: Richard Mueller), Techimex (owner: Richard Mueller), both with headquarters in Harmstorf, and Semitronics (owner: Richard Mueller) in Zug. The recipients were: Mahart Kft., Punto Franco and Budapest, and V/O Technopromimport, 117330 Moscow, Mosfilmovaskaya 35.

The provenance and make of the trade articles from the organ works in Moelln can leave few doubt about their presumed application: air-conditioning systems for large computers, electronic data processing accessories of all kinds, mainly VAX 11-780 computers which--like the computers impounded last month in Hamburg and Hälsinborg--serve mainly military purposes.

Richard Mueller left South Africa at the end of September on a direct flight from Durban to London and has disappeared from sight since then. Nothing has been heard except that he has been granted a limited residence permit in neutral Sweden. He maintains telephone contact with the outside world through through Axel Giza, his tax consultant ("According to my files Richard Mueller was absolutely clean"), who also advises him in tax matters.

The property in Jesteburg--which is in wife Sieglinde's name--is temporarily being administered by the head of Mueller's stud farm. This able employee has sold most of Mueller's Trakehners, some to horse lovers and some to horse butchers. The entire property is now up for sale. The starting price for negotiations; DM 9 million. Apparently the yacht "Tonga" will remain in the family's possession for the time being. Mueller has rented, and prepaid, an anchorage in the Neustadt Ancora yard for the period of 3 years.

Although there is no arrest warrant for him in Cape Town yet, Mueller has good reason to avoid South Africa until futher notice. The federal attorney's office would like to interrogate him in the matter of the former yard commandant at the Simonstown naval base, Dieter Gerhardt. Gerhardt has to defend himself as a suspected superspy of the Soviet secret service KGB to a court on the Cape. In mid-November the London SUNDAY TIMES accused Richard Mueller openly of spying for the Soviet Union.

It is unproven that Richard Mueller was acting on behalf of the Soviets beyond the limits of his export business. He was, however, good friends with Gerhardt for years. And when Mueller turned up in Moscow, as US businessman John Marshall testified to a US senate investigating committee, "the Soviets rolled out the red carpet." According to Marshall: "He was obviously someone they wanted to cultivate."

Given the current state of the investigations Mueller's case is difficult to define legally. The offenses for which Mueller has to stand trial in the United States do not justify extradition. The electronic equipment impounded in Hamburg harbor was--seen from a customs office viewpoint--goods in transit, irrelevant from a criminal point of view. The public prosecutor would have to prove--unless more material evidence is turned up--that Mueller has jeopardized "the peaceful coexistence of nations." Only in this way could he obtain a prison sentence.

If he has actually only engaged in illegal trade with computers, then there are really few reasons for Richard Mueller to remain in hiding. As long as he does not come up against too harsh judges, he will get off with 1 or 2 years probation, perhaps with less. Secret service activity is punished considerably more harshly.

Wife Sieglinde thinks the search for her husband is a clever intrigue on the part of the various secret services. She knows nothing of secret dealings in computers. Her husband, she says, has always wanted to help other people but generally he has received only envy and ingratitude in return.

This will probably happen in South Africa as well. On the great Buitenverwachting vineyard near Cape Town the Muellers had resumed their service to man which had been interrupted by their hasty retreat from the Lueneburger Heide. Immediately after they moved, Sieglinde Mueller told SPIEGEL, the first thing they did was to put all the children of their black workers in the bathtub. According to farm supervisor Andre Badenhorst, "Mueller really deserves a medal for everything he is doing here."

Anyone who likes to share with the poor is naturally entitled to some benefits himself. In 1980 Mueller acquired the 200-year old property for 2 million rand (about DM 5 million). Its expansion into one of the most magnificent vineyards in Cape Province cost at least the same amount again. Even far from their homeland the prosperous citizens from the Lueneburger Heide saw no reason to be anonymous. By the driveway to the main house a sign several meters square proclaims: "A New Residence Being Built for Richard Mueller."

Mueller's assistants Detlef Heppner from Raven near Lueneburg and businessman Volker Nast from Hamburg are also back from South Africa. They were arrested the week before last because they were materially involved in setting up the worldwide interlocking phantom concern.

Heppner is the technician in the management troika. Before he joined Mueller he worked on the development of the integrated fire control system for the Leopard-2 tank.

On 5 May 1975 in San Fransisco, along with Mueller and several American business partners, and in 1981 in Baltimore, Volker Nast had been accused of violating the embargo regulations. The US citizens involved were sentenced. The two Germans fled just in time to the FRG.

As a senate report of 15 November 1982 states, Mueller and Nast were "deeply involved in the illegal diversion of US technology to the Soviet Union." By way of Canada they had illegally traded in parts of a manufacturing facility for semiconductor elements--the basic building blocks of electronic chips--from the computer Eldorado Silicon Valley (California) to the Soviet Union.

The hot items had been ordered by Lothar Haedicke, a representative of the German Honeywell branch, and delivered by the manufacturing companies Kaspar Electronics and II Industries to Moscow through Mueller's P.O. box companies USA Trade and Semitronics in Montreal and Semitronics in Zuerich.

The business relationships between Moscow and California broke off before the chips factory could begin production. US customs intercepted several air freight crates intended for Nast's cover firm in Hamburg, Reimer Klimatechnik, in Kansas City and sent them on via New Jersey, Hamburg and Amsterdam to Moscow. When the recipients opened the crates, they no longer contained computer parts from Silicon Valley but Kansas sand. Haedicke was later sentenced in Stuttgart to 4 years in prison for espionage.

US customs brought off another coup against Mueller in the summer of 1980. Following a chase good enough to be filmed and which involved 18 agents, Nast's assistant Rolf Peter Herms was arrested at the PanAm counter in New York's Kennedy airport. In his suitcase he had an MSR 903 microwave receiver, which the Micro-Tel Corporation in Baltimore built to listen to military satellites as well as to Air Force One, the US president's jet.

The VAX computers confiscated in Hamburg arrived back in the United States last Monday. Secretary of Defense Caspar Weinberger, in a reciprocal gesture, expressed his thank to the government in Bonn for "saving" the Western alliance from "enormous damage."

At the beginning of the month Richard Mueller emerged briefly from hiding. In an interview with the Stockholm newspaper SVENSKA DAGBLADET he said: "The charges against me still have to be proved.

That is the object of the work being conducted currently.

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FRENCH-U.S. JOINT VENTURE DEVELOPS 'TRIMOS' TECHNOLOGY

Paris L'USINE NOUVELLE in French 19 Jan 84 pp 48-49

[Article by Herve Rolland: "Power Electronics: Texet Is Pushing Prices Down"]

> [Text] The new French-U.S. company Texet started industrial production this week. One of its assets: the Trimos technology.

Things go fast in the electronics sector. The Texet company, which was created late in 1982, started producing its components industrially in mid-January 1984. What is Texet? A newcomer in the field of power electronics, created by U.S. technicians from Texas (whence its name) but with capital that is 70 percent French and was raised by Paribas. And, above all, with ideas for new technical products for power circuits.

Their structure is called Trimos (a U.S. registered trademark of Texet) and makes it possible to optimize the geometrical layout of MOS [metal-oxide semiconductor] type components: the cells are not square, but triangular. While RTC [expansion unknown], too, uses cells shaped like equilateral triangles, the cells of Texet products are shaped like right triangles. These geometries make it possible to reduce the silicon area by 10 percent (silicon accounts for three fourths of the component cost).

Trimos can be considered as a step toward the new generation of power electronics products, which is now referred to as "Smart Power," i.e. "intelligent" components, another Texet specialty. "During the past 10 years," we were told by Jean-Paul Bouvard who is in charge of Texet sales in Europe, "engineers mainly tried to optimize the operation of microprocessors, reduce their size and simplify their production to obtain an inexpensive high-performance product that would be easier to program. But as soon as it is confronted to the real world, for instance to control a relay, discrete components must be added to integrate it into an industrial environment." And Jean-Paul Bouvard, who used to work for Motorola, added: "A very good 8-bit microprocessor costs less than 50 francs, and the electronic components required to pilot a 500-mA relay cost more!" The founders of Texet decided to tackle this discrepancy by improving as much as possible the electronic control components. The result was the Smart Power technology, on which large companies like Motorola, SGS [expansion unknown], RTC and Siemens are also working.

Smart Power is a blend of several technologies. For instance, a single chip may include a logic C-MOS [complementary metal-oxide semiconductor] part, a bipolar analog part, both made of silicon, one optoisolator made of gallium arsenide and one MOSFET [metal-oxide semiconductor field effect transistor]. "Two research contracts for products of this type have already been signed," Jean-Paul Bouvard indicated. Research is made at Saint-Michel-sur-Meurthe where Texet has its plant, research laboratory and design center.

In addition to its Smart Power operations, which will yield mainly specific products in limited industrial quantities, Texet produces power components (bipolar transistors, voltage regulators, etc.) in metal and plastic housings, and when the plant is fully operational it will have a maximum production rate of 70,000 units per day.

Texet: From the Vosges to Texas

Texet is an odd creation. Two plants were built in 1983, one on each side of the Atlantic: one at Allen in Texas (with 40 people) and the other at Saint-Michel-sur-Meurthe in the Vosges Mountains, with 24 people. For the time being, the diffusion process on the silicon chips is carried out in the United States, and encapsulation and testing are done in France. Americans are coming to Saint-Michel and several Texet France engineers and technicians are spending a few years in Allen to learn diffusion, product design, etc. They will be coming back until July 1986, and then there will be an exchange of responsibilities. The two plants will then be ready to operate independently, with identical production lines and processes, so that production will be homogeneous.

This approach was received very favorably by the Strasbourg and Nancy universities and by the Nancy School of Mines, which provide engineers and technicians to Texet and whose proximity was also a decisive factor in selecting the French plant site. The repatriation of diffusion operations to France was one of the conditions imposed by the French authorities prior to granting an aid to Texet. The total amount of Texet investments in France is expected to exceed 30 million francs.

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